

A proposal for using artificial intelligence in the field of school psychological counseling in the context of e-learning in Algeria.

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Abstract:

Through this scientific paper, our aim is to develop counseling practice in the Algerian school environment to keep pace with current technological advancements and align with the e-learning system. This involves remotely supporting students psychologically and educationally using artificial intelligence techniques. We relied on a theoretical methodology and drew on previous studies and relevant theoretical literature related to the topic of this research. We presented the proposed model for the electronic counseling platform, which is based on artificial intelligence algorithms. The results show that the electronic counseling platform provides a range of interactive counseling services to help students build their future personal projects. The mechanisms for implementing this involve adopting this designed platform using artificial intelligence algorithms in a dynamic digital environment.

Keywords: Artificial intelligence; school counseling; e-learning.

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1. Introduction

Our current era has witnessed tremendous development in all fields due to the ongoing advancements in the technological field, especially in information and communication technologies. This has been brought about by human intelligence, utilizing the cognitive acquisitions and scientific experiences of the mind from previous experiments. Humans have been able to artificially simulate their innate intelligence in dealing with various situations with high precision, creating a recent scientific leap that has changed the lifestyle pattern. The education sector, like other sectors, has been affected, and there has been a strengthened focus on e-learning as one of the advanced methods that allows for distance learning through the use of communication mediums and technology.

Distance learning is considered one of the contemporary methods for acquiring knowledge and education. It relies on transferring an educational program using media to convey educational content from an educational institution to specific locations, surpassing the boundaries of time and place. This method aims to save the learner effort and time, meeting the learner's cognitive needs and ensuring their independence in acquiring knowledge outside the traditional educational environment. It fosters an interactive environment between the teacher and the learner through synchronous communication using electronic means (Azouz, 2017).

In the same context, Wargui (2022) highlighted the contribution of artificial intelligence outputs in education through emphasizing its characteristics, areas of application, and mechanisms for implementing it in the field of AI education, such as smart boards and educational robots, relying on previous studies related to the subject (Wargui, 2022).

Due to the changes in the modern era that have affected the educational field and its curricula, it is essential to consider meeting the learners' needs for counseling services at all stages of their age. Al-Obaidi and Al-Obaidi (2010) suggest that educational counseling and

guidance are processes aimed at enlightening learners to help them achieve psychological harmony and academic adaptation by insightfully addressing their problems, showcasing their creative potentials, and nurturing them. They highlight the use of educational counseling methods in addressing psychological issues in the school environment, assisting learners in mapping out their future projects within a framework that aligns with their academic abilities and personal characteristics, enabling them to make informed decisions regarding their future academic and professional paths (Al-Obaidi & Al-Obaidi, 2010). Zar'an (1980) emphasizes the integration between guidance, counseling, education, and learning, stating that modern education includes psychological guidance and counseling as an integral, inseparable part (Zahran, 1980) .

Furthermore, Ben Khalifa (2021) emphasized the necessity of serious attention to remote school guidance and counseling by the Ministry of Education's officials, as it has positive implications for learners' mental health and effective performance, especially in guiding learners remotely during crises such as natural disasters, disease outbreaks, and pandemics, particularly the COVID-19 crisis, which has imposed a new approach focusing on social distancing as a precaution to ensure health safety (Ben Khalifa, 2021).

Due to the challenges facing Algeria in improving the process of distance education at all levels, and considering school counseling as an educational pedagogical action that aligns and integrates with the objectives of the educational-learning process, through this scientific paper, we aim to draw the attention of the officials at the Ministry of National Education to the necessity of considering solutions to address this gap and contribute to the focus on remote learners cognitively, psychologically, and socially to form a mature individual intellectually, psychologically, and socially. This is done by presenting a proposal that includes preparing an electronic platform for school psychological counseling based on artificial intelligence algorithms, complementing the role of remote e-learning platforms in human resources development. This will be achieved by addressing the following problem:

How can artificial intelligence techniques be applied in the field of educational counseling practice in e-learning in Algeria? And what mechanisms are adopted in this regard?

2. Literature Review

2.1 Previous Studies

The study by Westman et al. (2021) addressed the challenges of career counseling in the era of lifelong learning and the role of artificial intelligence in supporting counseling in higher education and the professional world. The results revealed the value and functions of artificial intelligence in this field, with a focus on various counseling agents and their maturity levels. The research recommendations included aspects related to counseling interaction agency, counseling data development, and ethical issues (Westman & Al, 2021).

The study by Miao and Holmes (2021) discussed the contribution of artificial intelligence in addressing challenges in the field of education, developing educational practices, and providing recommendations for policymakers on the need to establish an organizational framework on how to leverage its benefits and avoid risks resulting from the increasing connection between artificial intelligence and education. The focus was on ensuring ethical, comprehensive, and fair use of artificial intelligence in education, emphasizing the importance of ethical considerations. The study also explored the role of artificial intelligence techniques in enhancing education and its challenges (Miao & Holmes, 2021).

The study by Tahrawi and Tashma (2022) delved into artificial intelligence and multiple options for students with learning difficulties in order to enhance their education and develop their abilities using innovative artificial intelligence techniques that increase students' interaction with course materials, inspiring them to succeed and positively impacting their academic performance. The results emphasized the adoption of artificial intelligence in creating an interactive and stimulating educational environment that aligns

with the characteristics of students with learning difficulties and meets their educational needs (Tahrawi & Tashma, 2022).

The study by Shete et al. (2022) discusses the use of artificial intelligence in the field of education and its impact, reviewing both the advantages and disadvantages. Additionally, this study offers a proposal for creating an educational platform based on artificial intelligence (Shete & Al, 2022).

The study by Harry (2023) highlights the use of artificial intelligence techniques in education, such as machine learning and natural language processing, to enhance the learning experience. This includes the use of data analysis algorithms to identify patterns and make predictions. The results emphasize the potential benefits of using artificial intelligence in education, such as the possibility of improving student outcomes through self-regulated learning with automatic monitoring through assessment and evaluation of learners' performance while considering ethical considerations, transparency, and fairness in AI-based educational systems (Harry, 2023).

Reviewing previous studies related to our current research topic, it becomes apparent that, in general, theoretical research has presented artificial intelligence and its extent of use in the field of education. Except for the study by Tahrawi and Tashma (2022), which focused on the use of artificial intelligence in caring for students with learning difficulties. Our study stands out as a research paper where we present the theoretical literature related to our proposal of using artificial intelligence in the field of school psychological counseling to support the process of distance e-learning in the development and preparation of human resources.

2.2 The concept of artificial intelligence and its characteristics

It is an automated system programmed to simulate human intelligence to compensate for it in performing various tasks and functions with a high capacity for understanding, analysis, and inference. It can also be utilized in the field of education to support the

updating of educational and counseling methods with the aim of achieving comprehensive quality in its outcomes and ensuring the well-being of learners in performance.

Artificial intelligence is characterized by its ability to represent knowledge through symbols, ensuring comprehensiveness and accuracy. It adopts an optimistic empirical approach to explore, process, and apply data in effective solutions. It excels in processing missing information comprehensively and has a continuous and persistent learning and evolving capacity to maintain the quality and effectiveness of its performance regardless of changes. Additionally, it demonstrates high and accurate rapid processing of hypotheses, distinguished by a vast, stable scientific and cognitive knowledge base that can be updated and upgraded according to the era's changes.

The aim is to achieve a comprehensive simulation of human thinking and handling of various issues and situations by enhancing its ability to infer from previous experiences and apply them effectively in similar situations. Furthermore, it is characterized by its self-enhancing ability to promote thinking and perception by acquiring new knowledge and applying it accurately and comprehensively. This aspect makes it of interest to researchers and thinkers for endorsing its adoption to develop the field of education (Al-Ghamdi, 2024).

2.3 The concept of school counseling

It is the counseling and educational services provided to students by educational and career guidance counselors in educational institutions or distance learning centers. This is to support them psychologically and socially, help them achieve psychological and social harmony by recognizing themselves and their abilities, and assist them in adapting to the school environment. This is to help them reach their maximum aspirations in achieving their future ambitions and preparing them for professional and social life (Education, 2015).

2.4 Activities carried out by educational and career guidance counselors in the field of school counseling

Whether they are assigned in middle schools, high schools, or distance learning centers, counselors engage in activities that fall within the axis of psychological care for students. This includes conducting individual or group counseling interviews, implementing counseling programs aimed at providing psychological and educational support to students facing specific problems and academic difficulties. They assist these students in adapting to the school environment, mediating potential conflicts, and contributing to the early identification of academically challenged students. They do so using appropriate scientific methods and techniques through individual or group interventions within counseling cells and psychological follow-up committees (Education, Organizational Procedures for the Tasks and Activities of School and Vocational Guidance Counselors Appointed in Middle Schools, 2018).

2.5 The concept of e-learning

It is a learning method that relies on modern technologies in the field of media and communication, using technological tools such as computers, smartphones, the internet, and various necessary audio and visual media for communication. This is to help learners receive information in an interactive environment, minimizing time and effort and maximizing the benefits of education in a broader sense (Rai , 2020).

3. Methodology

The current research is a scientific paper where we relied on the theoretical approach that involves collecting information and data relevant to the topic, analyzing previous studies conducted on it to reach conclusions about the studied problem.

As a tool for the current research, we relied on the design model by Dr. Akram Fathi Mustafa Ali(2018), considered one of the most prominent and widely used models in the field of designing and producing electronic instructional floors. It is an integrated and diverse

electronic environment that includes a variety of stimuli prepared by the instructor according to the instructional design model for electronic guidance software. Within the framework of strategies that the mentor or student interacts with, this aims to achieve instructional goals that help the student achieve psychological, educational, and social compatibility and build their future project (Ali, 2018).

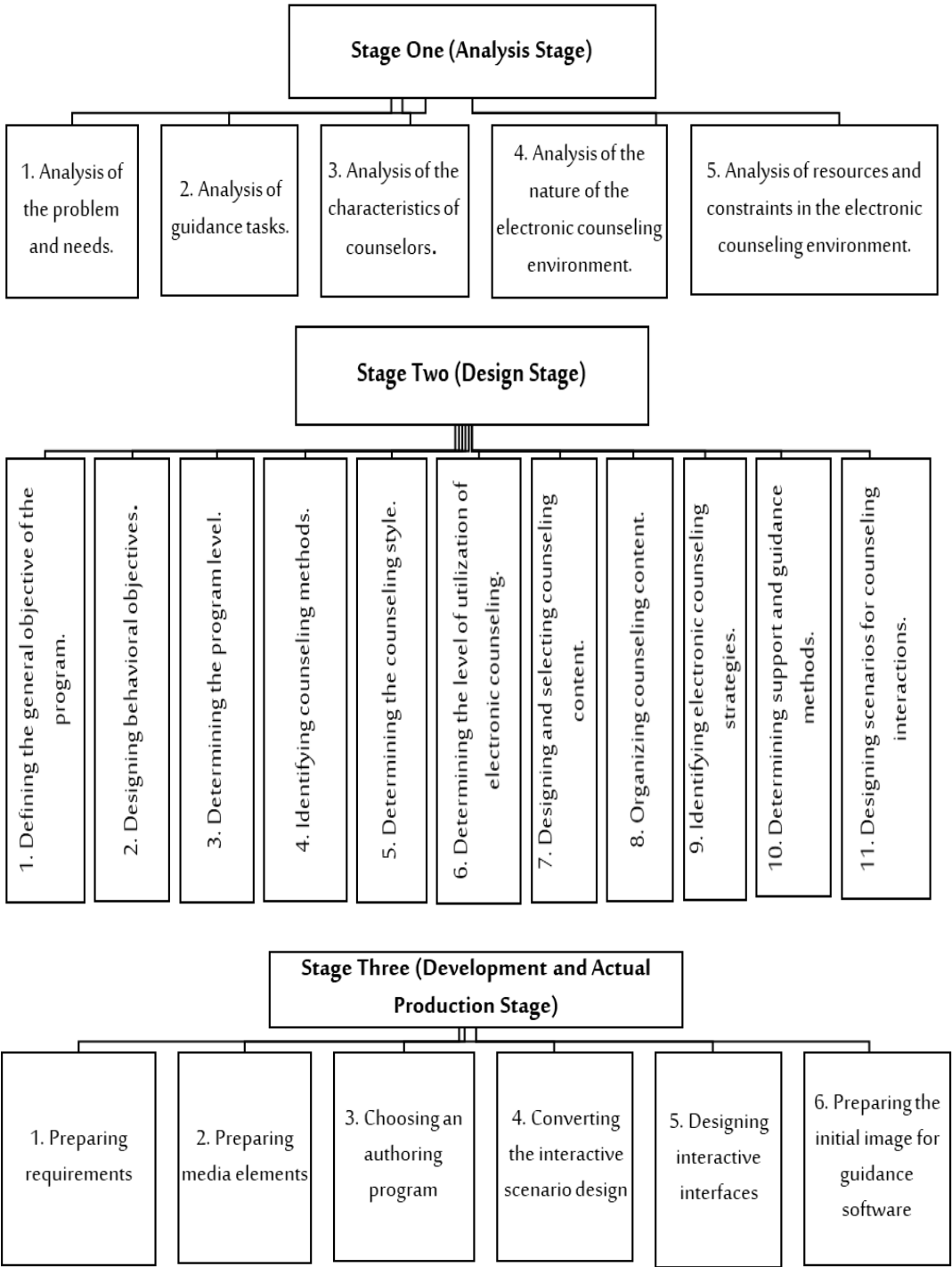
4. Results

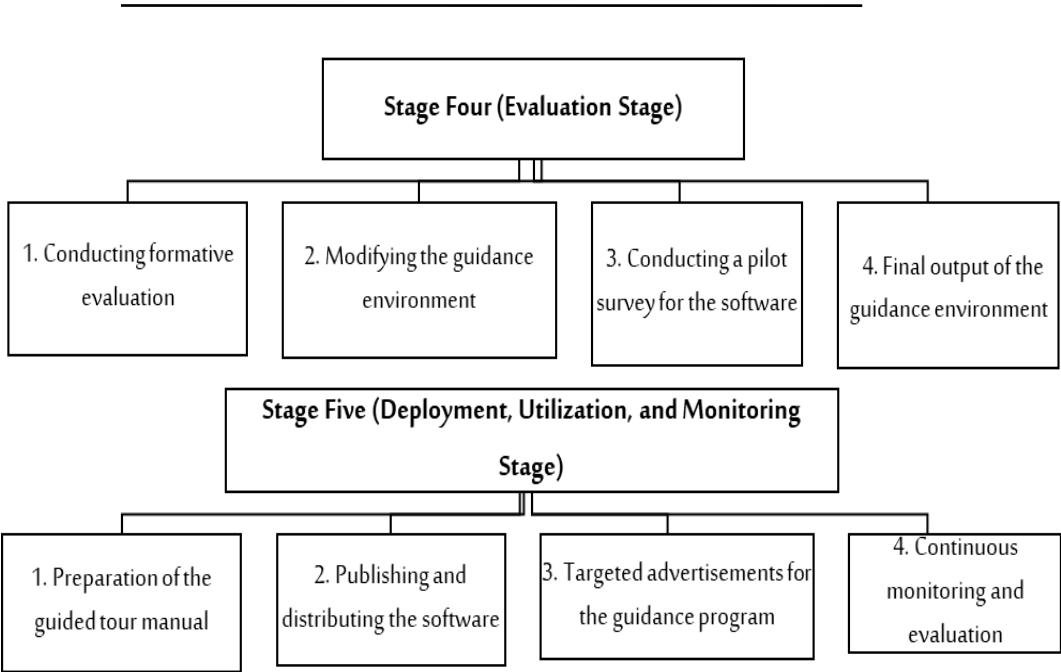
Through reviewing the theoretical literature and previous studies related to the research topic, we concluded that artificial intelligence applications can be adopted in the field of education and integrated according to the electronic guidance framework to facilitate and enhance guidance performance through a variety of innovative and effective tools. This includes smart chatbots that provide guidance and support through interaction between the user and the program via text or voice. Additionally, augmented reality technology adds information to real-world settings in multiple dimensions to enhance the learning experience, while virtual reality can provide interactive learning experiences with diverse environments. Text-to-speech conversion contributes to enhancing communication and online learning. Expert systems offer specialized solutions by simulating expert human behavior. Educational robots work on providing outstanding education through machines capable of guiding lessons and stimulating learning. Adaptive intelligent education offers tailored learning experiences to meet each learner's needs by employing artificial intelligence techniques. Intelligent assessment evaluates thinking skills and performance while providing feedback automatically, and character recognition and reading technology convert images and text into text files to facilitate learning and communication (Shelly, 2022).

As for the mechanisms employed in implementing this, we adopted the model by Ali (2018) as it is easy to implement and applicable in the Algerian e-learning system using artificial intelligence techniques. The design of this electronic guidance framework includes a

series of steps that can be summarized in stages as follows:

Fig.1. Stages of designing electronic guidance platforms





Source: Prepared by the researcher based on Ali’s model (2018)

Stage One (Analysis Stage)

The process of problem analysis and needs assessment aims to identify the issues and needs of the guided individuals and formulate them as general objectives. This process involves identifying the current situation using measurement tools, comparing the performance of the guided individuals to the desired level, prioritizing tasks, suggesting appropriate guidance solutions, and defining the desired goals that the guided individuals should achieve.

Moreover, the analysis of guidance tasks aims to divide the general objectives into main and sub-components, and identify guidance tasks that resemble the topics or concepts in the subject matter. This is done by pinpointing the main and sub-tasks using appropriate analysis methods, evaluating the analysis by revisiting it using different approaches and consulting experts, making necessary modifications, finalizing the analysis, and creating a cognitive map of the required final tasks while specifying the prerequisites for guidance.

Analyzing the characteristics of the guided individuals aims to assess the general and specific characteristics of the targeted group, including mental and emotional aspects, physical capabilities and skills, and the level of input behavior. This analysis entails identifying the knowledge and skills that the guided individuals possess at the beginning of the guidance process.

Regarding the analysis of the nature of the electronic guidance environment, it aims to understand its components, characteristics, standards, and requirements. This analysis includes assessing the resources and constraints in the electronic guidance environment by identifying and evaluating the available resources, obstacles, and limitations that impact the design, development, utilization, and management of assessment in the electronic guidance environment.

Stage Two (Design Stage)

The design processes aim to establish the conditions and specifications of learning resources and processes, which include designing guidance programs. These programs consist of a set of direct and indirect counseling experiences and strategies that are planned and organized according to sound scientific principles. Counselors specializing in psychological counseling ensure their implementation to assist guided individuals in achieving smooth growth and psychological harmony while interacting with life's challenging situations in a healthy and constructive manner.

We specifically mention counseling programs that contribute to overcoming academic difficulties, such as counseling programs focused on psychological and pedagogical preparation for students approaching official examinations. Additionally, various counseling programs address psychological, developmental, social, and behavioral problems through either group or individual counseling, depending on the nature of the issue. These programs utilize interactive communication methods and technologies to provide assistance.

The overall objective of the electronic counseling program is designed concerning the

knowledge, skills, and attitudes related to the counseling program content. Behavioral objectives are meticulously and clearly designed to outline the expectations of the guided individual after the counseling process. This is achieved by transforming the counseling task map into observable and measurable behavioral objectives. For example, the electronic counseling program can be segmented according to its levels based on curriculum and psychological counseling strategies. It can be divided into a preventive counseling program aimed at preventing, diagnosing, and treating issues, a developmental counseling program aimed at guiding individuals and enhancing their development, and a therapeutic counseling program aimed at assisting the guided individual in overcoming challenges and achieving personal growth.

Counseling methods can primarily be categorized into direct counseling, which focuses on the counselor providing direct assistance and support to the guided individual, and indirect counseling, which focuses on the guided individual and assists them in making decisions to solve their problems. Additionally, optional counseling combines more than one approach to problem-solving in a way that effectively suits each guided individual's situation.

It is essential to determine the counseling style based on the size of the target group, which includes various styles such as mass counseling, group counseling, and individual counseling. This aims to develop an appropriate counseling strategy and select suitable resources. It is important to know the appropriate methods for each style, such as presentations, lectures, small group sessions, or individual sessions.

In addition to determining the level of integrating e-learning alongside traditional face-to-face learning in the counseling process, it ranges from partial supportive integration to support counseling processes to solely using e-learning to accomplish the counseling process. It also includes integrated collaborative integration with traditional counseling to

contribute to achieving counseling objectives.

Working on defining the content of the program to achieve behavioral objectives and arranging it according to priorities is essential. The nature of counseling tasks and the characteristics of the guided individuals must be taken into consideration, along with meeting their needs and desires. Counseling content can be organized according to any model of content organization. Electronic counseling strategies include a plan used by the counselor to deliver counseling content and determine appropriate activities. Additionally, defining support and guidance methods in an electronic counseling environment, such as synchronous and asynchronous communication and their integration, is important.

Stage Three (Development and Actual Production Stage)

During the development and production stage of electronic counseling software, the counseling scenario is transformed into an electronic environment ready for use by preparing the necessary requirements, creating multimedia elements, and selecting the appropriate authoring tool. This involves implementing and designing counseling interactions, preparing the first version of the software for operation, and presenting it to users.

Stage Four (Evaluation Stage)

The initial version of the software is assessed and modified based on feedback from experts in the counseling field and educational technology. This evaluation involves presenting the software to specialists to ensure the achievement of specific goals, the quality of different elements, and ease of use. The software is then adjusted based on the evaluation results and experimental testing on a sample of targeted users to identify usability challenges and receive suggestions. Subsequently, the final version of the counseling environment is prepared based on the final output of the evaluation and modification processes

Stage Five (Deployment, Utilization, and Monitoring Stage)

In the final stage, a counselor guide is prepared in the form of a small booklet containing some of the software content. The software is distributed through CDs, the internet, or as a mobile application. This step also includes advertising campaigns to increase awareness of the counseling program. Additionally, continuous monitoring and evaluation of the software performance are carried out by assessing feedback and analyzing data to identify opportunities for future development. This is done by evaluating counselors and the counseling environment using a variety of tools and technologies (Ali, 2018).

5. Discussion

The use of artificial intelligence applications in the field of education through electronic platforms has been found to be beneficial. Gligorea et al. (2023) concluded that AI and machine learning algorithms are useful in customizing learning experiences, improving learning trajectories, enhancing engagement, and boosting academic performance. The integration of artificial intelligence and machine learning in e-learning platforms significantly enhances the effectiveness and customization of the educational process. The study results underscore the adaptive learning potential to revolutionize education by meeting individual learners' needs (Gligorea & Al, 2023).

It's crucial to address both the strengths and weaknesses of artificial intelligence in education, as highlighted in (Shete & Al, 2022) study. Additionally, Tahrawi and Tashma (2022) highlighted the role of artificial intelligence in enhancing the education of students with learning difficulties by utilizing innovative AI technologies to increase students' interaction with the curriculum. This group requires support from guidance and counseling advisors to provide services that assist them in adapting and integrating into the school environment (Tahrawi & Tashma, 2022).

In our current study, the results have shown the potential application of artificial

intelligence algorithms in designing guidance systems that meet students' individual needs effectively. This is achieved through analyzing their data and predicting their individual requirements based on their age group characteristics. It enables students to self-discover their capabilities and talents through personality tests, inclinations, interests, academic achievements, and providing necessary guidance. Moreover, evaluating and assessing the counseling process involves monitoring the guided student's behavior through assignments and follow-up tests based on the type of issue. All of this is done through the proposed interactive counseling approach via electronic platforms to meet learners' needs.

Regarding the mechanisms underlying electronic counseling practice in providing these services, it relies on the utilization of designed electronic platforms based on artificial intelligence techniques that align with the distance e-learning format. A study by Dogan et al. (2023) highlighted the analysis of utilizing artificial intelligence techniques in online teaching and learning processes. This includes understanding how algorithms can be used to recognize and predict students' behaviors, adaptive and personalized learning supported by artificial intelligence technologies (Dogan & Al, 2023).

The proposed model in this research allows for analyzing the problems and needs of remote counselors in the form of general objectives, counseling tasks analysis, characteristics of the counselors, nature of the online learning environment, available resources, and potential challenges. It also facilitates the design of electronic counseling programs and their implementation in the electronic counseling environment to be ready for use. Moreover, it enables the evaluation and adjustment of these programs before final output, publication, and utilization.

6. Conclusion

Through numerous international, Arab, and national experiences that have proven their effectiveness in education through electronic platforms and environments with positive outcomes, particularly in higher education, the design of an interactive electronic counseling

platform can be adopted. Utilizing the latest digital technologies, namely artificial intelligence, through the collaborative efforts of school counseling specialists, software engineers, and artificial intelligence experts in preparing this design. This allows us to predict the success of this proposal due to the importance of school counseling in supporting and enhancing the education process. It is anticipated to be highly successful in the traditional education system and distance learning system, positively impacting the performance of counseling practices in Algerian schools in general, especially in addressing the problems faced by guidance counselors related to the impossibility of providing counseling services to all students in educational institutions due to the large number of students and lack of sufficient time for that. This contributes to the development and enhancement of school life by achieving the principle of equal opportunities between learners systematically in educational institutions and distance learners by caring for them from all aspects, particularly in accompanying students in forming sound perceptions about their future academic, professional, and personal projects through making conscious decisions and achieving mental health and self-social harmony, enabling them to acquire knowledge through proper methods and guiding learners to achieve their maximum aspirations and future ambitions. This positively reflects on the quality of outputs in the education sector, contributing to the Algerian state acquiring highly efficient human resources with significant responsibility in all fields.

Based on the research results presented, the researcher proposes the following recommendations:

- Highlighting the importance of counseling practices in educational institutions in achieving national educational goals and the necessity of integrating the process of school and career guidance in the field of distance education, using artificial intelligence applications to ensure immediate interaction.

-The need to keep pace with the cognitive and technological developments in counseling by providing continuous training to school and career guidance counselors to adapt to the era's transformations, especially in communication and technological communication media, in order to provide counseling services electronically.

-Directing the attention of specialists in the field of school and career guidance towards equipping students with self-guidance strategies and skills within the counseling practice program in distance education, such as developing Android applications that can be downloaded on smartphones to facilitate this, as well as using artificial intelligence applications that help analyze the behavior of students and classify them according to their specific patterns to provide suitable guidance.

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